Sociological strategies to allay unfounded perceptions of risk and encourage public/private support for microbial biocontrol projects

Keith Douglass Warner
Center for Science, Technology & Society
Santa Clara University

- "Despite the lack of documented serious conflicts, there is an air of pathophobia that has brought to a virtual standstill the application of the classical approach in the use of plant pathogens for weed control." (Freeman and Charudattan, 1985)

- "Despite the lack of documented serious conflicts, there is an air of pathophobia that has brought to a virtual standstill the application of the classical approach in the use of plant pathogens for weed control." (Freeman and Charudattan, 1985)
- Phobia = irrational fear

Scientific logic

More
research

→ → → Better
knowledge

→ → → Improved
implementation

Lay public logic

More science

→ → → More to worry about

→ → → Increased fears

Where is the deficit?

1. Scientific literacy, knowledge

Where is the deficit?

1. *Scientific literacy, knowledge*
2. Trust: publicly perceived trustworthiness of scientific institutions

Fundamental recommendation:

1. To encourage transparent regulatory decision making criteria and processes
2. that foster meaningful public participation
3. by constructing public trust
4. with public engagement processes
5. that link trustworthy messengers,
6. and appropriate messages

Outline

- Appropriate messages and trustworthy messengers
- Public engagement processes construct public trust and foster meaningful public participation
- Transparent regulatory decision making criteria and processes
- Recommendations

1. Appropriate messages and trustworthy messengers

The public perceives risks differently than scientists

1. Risk = hazard X exposure

The public perceives risks differently than scientists

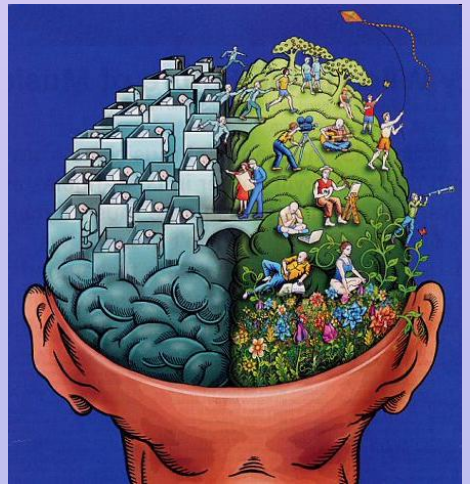
1. Risk = hazard X exposure
   a. +++ consistent quantifiable
   b. - - - - public feels excluded

The public perceives risks differently than scientists

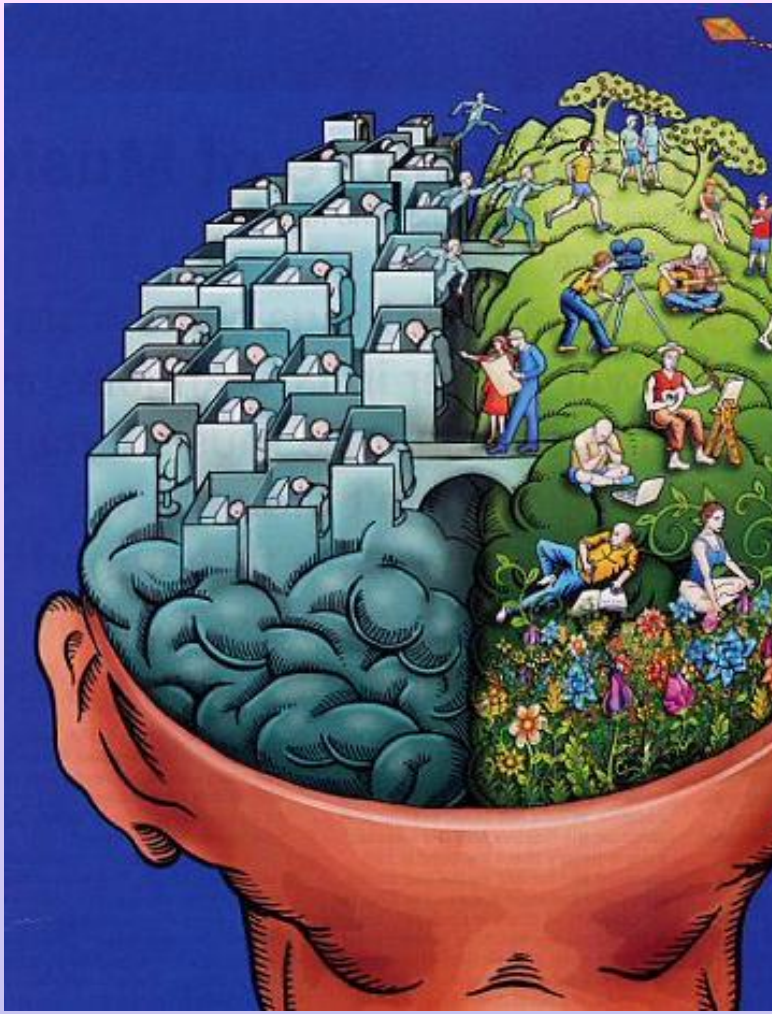
1. Risk = hazard X exposure
   a. +++ consistent quantifiable
   b. - - - - public feels excluded
   c. Perverse outcomes possible: augmenting public fears

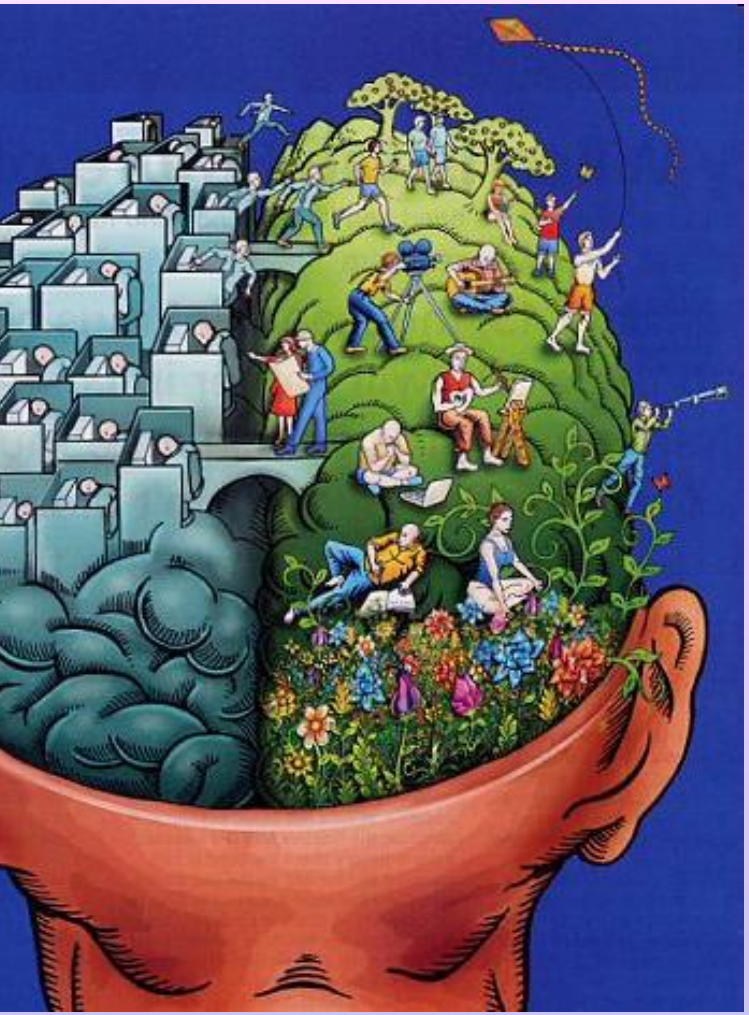
Two modes of risk perception

Recent research in cognitive psychology and neuroscience has demonstrated two fundamental different ways in which human beings conceptualize risk (Slovic et al., 2004).



The "analytic" system uses formal logic, probabilistic reasoning, and scientific deliberation.





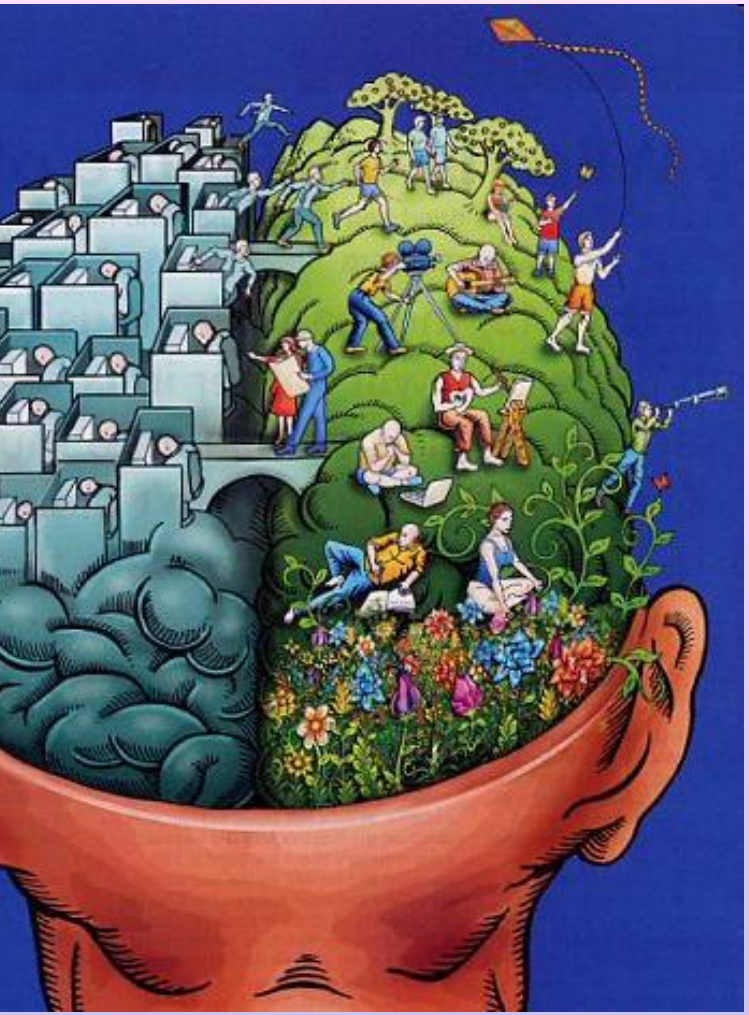
The “experiential” system is intuitive, largely automatic response to perceived danger, and often inaccessible to subjective awareness.

Lay public logic

More science

→ → → More to worry about

→ → → Increased fears



- human evolutionary processes
- select against those who fail to perceive environmental risks (e.g., larger predators, foul water)
- the default approach to human risk perception (Slovic et al., 2004).

Implications:

1. Perverse outcomes occur when the analytic risk assessment paradigm is used to communicate with audiences who can only use experiential risk perception paradigm.

Implications:

1. Perverse outcomes occur when the analytic risk assessment paradigm is used to communicate with audiences who can only use experiential risk perception paradigm.
2. Scientists are trained to use the risk assessment paradigm

Use the right metaphor

- Don't use militaristic metaphors (Larson 2005)
  - Attack
  - Battle plan
  - Biological invasion, biological warfare
  - Fight
  - Weapon

Use the right metaphor

- Don’t use militaristic metaphors
- Analogy of a pharmaceutical (Simberloff & Stiling 1996)
- The public needs a problem definition before the remedy!

Public asks very simple questions:

- *Why introduce new organism to an environment?*
- *What will a control agent do once it consumes all its prey?*

Scientific controversies can undercut the perceived trustworthiness of all scientists & institutions

1. Controversies considered routine by scientists, when shared with the public, erode public support for science
2. Communication strategies should be informed by this.

Not data! Not statistics!

The public evaluates proposed decisions not on data, but on the perceived trustworthiness of the messenger.

Recommendations: messages

1. Public messages should always establish the problem definition first (as the premises for any proposed introduction).
2. Consistently explain why a novel introduction is justified (economics).
3. Use pharmaceutical or medical analogies, not militaristic metaphors (never use “phytopathogen” in public).

Recommendations: messengers

4. Create intentional partnerships with trustworthy messengers (e.g., stakeholders)
5. Decision-making process improved by a different form of external scientific peer review (not perceived insiders) guided by clear criteria accessible to public

Public engagement processes construct public trust and foster meaningful public participation

Public engagement processes construct public trust and foster meaningful public participation

Typical NEPA practice:

1. Public communication
2. Public consultation

Public engagement processes construct public trust and foster meaningful public participation

Typical NEPA practice is not sufficient to address contemporary public risk perception; it generally fails to:

1. Foster meaningful participation
2. Construct public trust

Public communication

Scientists
Public agencies

Generic
lay publics

Public consultation

Scientists
Public agencies

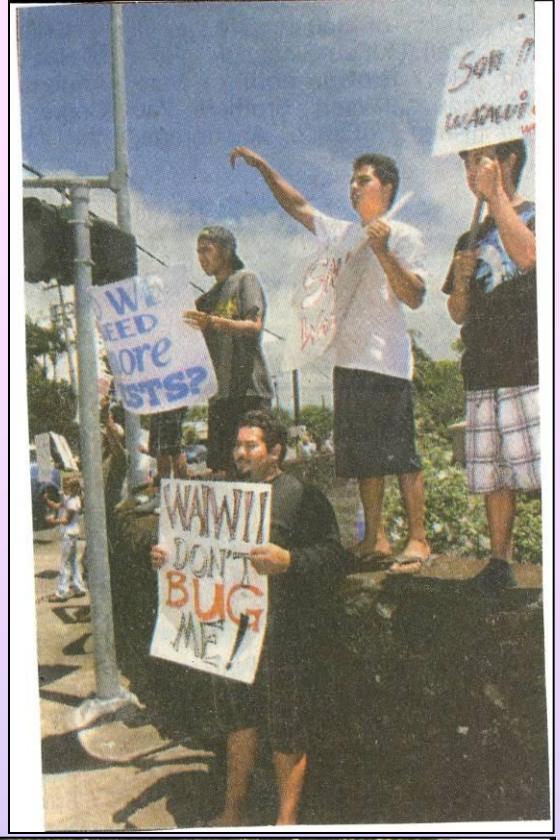
Generic
lay publics

New media has changed the American public

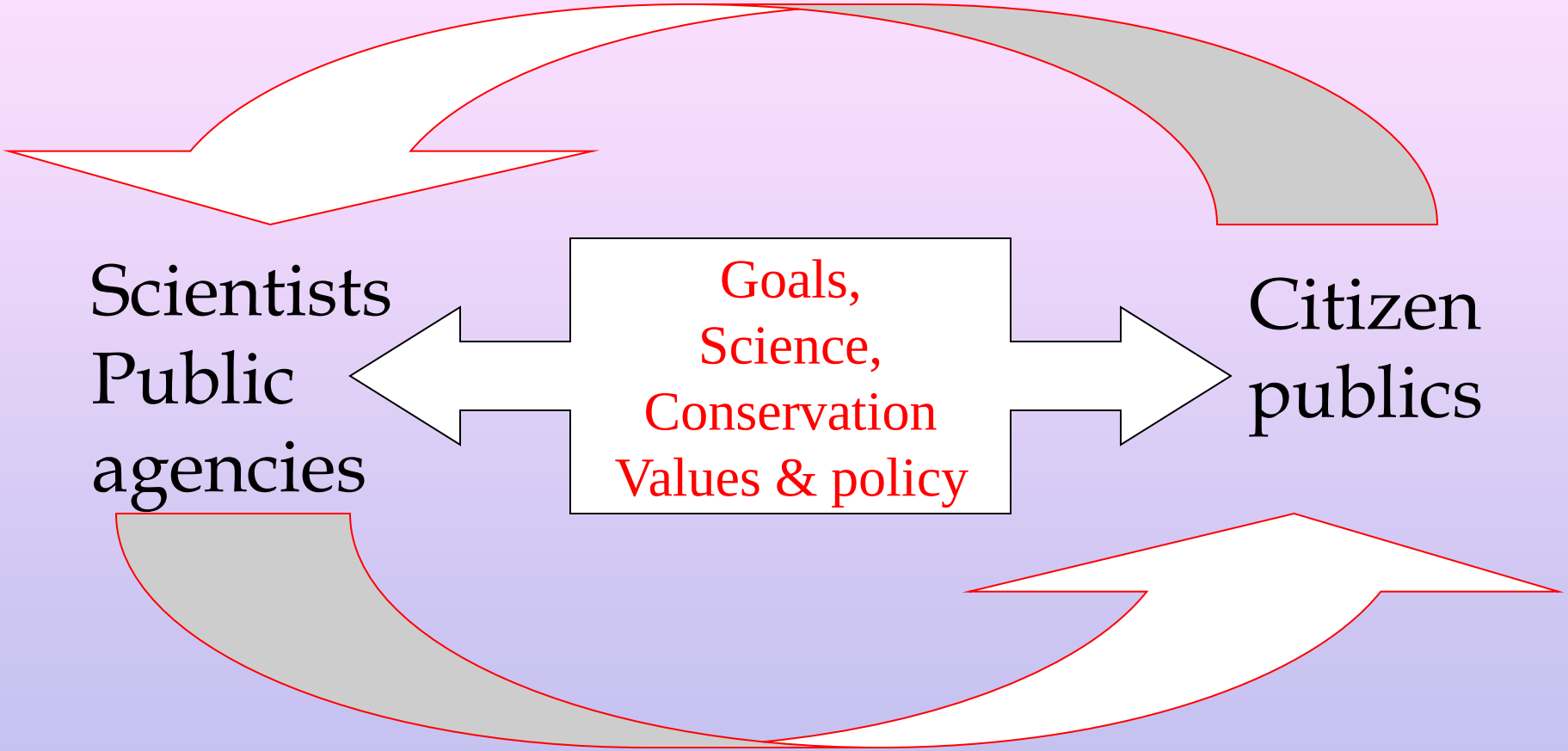
1. "Instant knowledge"
2. Public fear and mistrust are at record highs….and these are more real to the public than scientific knowledge
3. Lay public unconstrained by evidence or logic
4. Fringe voices get the microphone

New media has changed the American public

1. "Instant knowledge"
2. Public fear and mistrust are at record highs….and these are more real to the public than scientific knowledge
3. Lay public unconstr… by evidence or logic
4. Fringe voices get the… microphone



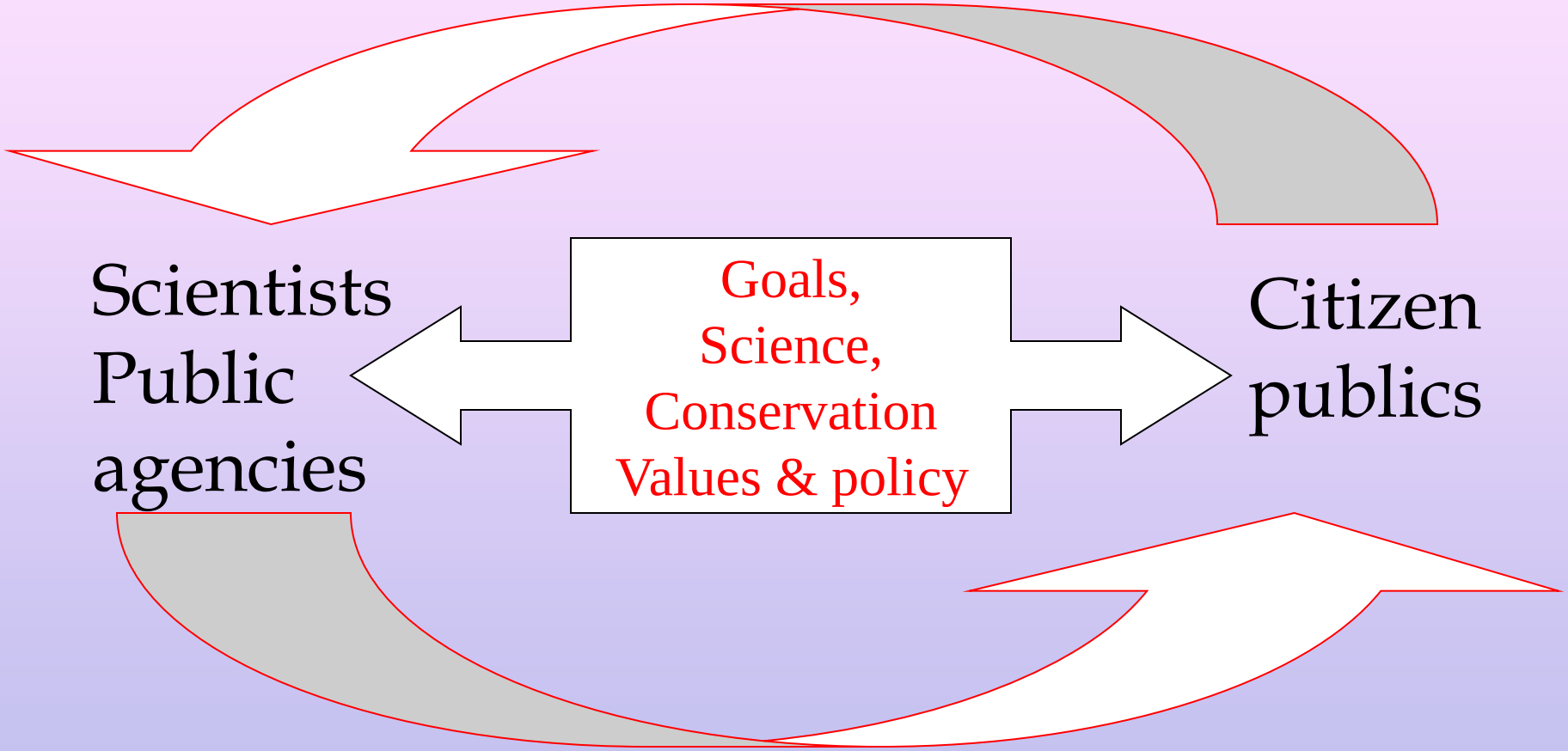
Public engagement



Public engagement: how

1. Appropriate sample of the public and representatives of stakeholders
2. Semi-autonomous
3. Requires ground rules for discussion
4. Establish consensus scientific views
5. Facilitate deliberation
6. Mutual learning

Public engagement



Has to be constructed!!

Public engagement: goals

1. Aims for quality participation: meaningful input
2. Practical steps toward common good by identifying overlapping interests
3. Builds broad consensus for “big picture” goals for practice & policy

ERMA New Zealand

Investigating Biological Control and the HSNO Act

ERMA New Zealand Report

April 2010

and its burrowing nature damages embankments and drainage systems.

tissues; can cause entire crown to wilt before a tree dies.

European grapevine moth*

Lobesia botrana

Larvae of multiple generations feed primarily on grapes and their flowers, exposing clusters to rot and disease.

Burrowing nematode

Radopholus similis

Plant parasite destroys roots, degrading plants' physical stability and nutrient/water uptake, reducing yields.

Tomato yellow leaf curl virus*

Begomovirus (GEM2)

Spread primarily by silverleaf whiteflies, this virus causes stunting and can severely affect yields.

The Invasive Species Council of California and its advisory committee have developed a more comprehensive list of invasive species posing the greatest threats to California's resources, environment and habitat. This illustration provides highlights from that list. For details, please visit iscc.ca.gov.

INVASIVE SPECIES COUNCIL OF CALIFORNIA

Public participation

1. May "slow" the development of technologies, but over time, it is more economical, for it has the potential to foster networks of trust (Warner et al., 2008).
2. "anticipatory governance" because it actively solicits scientifically-informed public input prior to specific actions
3. fosters upstream public engagement

Transparent regulatory decision making criteria and processes

Transparent regulatory decision making criteria and processes

1. The introduction of a novel organism is also a political act.

Transparent regulatory decision making criteria and processes

1. The introduction of a novel organism is also a political act.
2. Necessitates an approach consistent with American democratic values.

Transparent regulatory decision making criteria and processes

1. The introduction of a novel organism is also a political act.
2. Necessitates an approach consistent with American democratic values.
3. Those are affected by a public decision should participate in that decision, or have their representative participate, or at the very least, be invited to participate.

Transparent regulatory decision making criteria and processes

In theory, these should:

1. increase the responsiveness of citizens,
2. increase the quality of public agency communication
3. result in "better" environmental decisions.

Transparent regulatory decision making criteria and processes

Better in this case means:

1. appropriate participation;
2. more public support for public environmental protection;
3. clarify the right articulation of science and democracy.

Meaningful participation

1. The right participants
2. Depends upon overall management and policy decision making criteria being made available
3. Fulfilling NEPA is not enough

Fundamental recommendation:

1. To encourage transparent regulatory decision making criteria and processes
2. that foster meaningful public participation
3. by constructing public trust
4. with public engagement processes
5. that link trustworthy messengers,
6. and appropriate messages

Thanks to….


NSF


SANTA CLARA UNIVERSITY
IHS
1851


cdfa
CALIFORNIA DEPARTMENT OF
FOOD & AGRICULTURE


Center for Science,
Technology & Society
@ Santa Clara University